sulfamethoxazole have not been successful in eradicating carriage.

The goal of such prophylactic therapy is not elimination of the carrier state but prevention of disease. There are no controlled studies showing reduction of systemic *Hemophilus influenzae* type b disease with chemoprophylaxis. A national collaborative study of this problem has just been concluded but the results are not available at this time.

Our own practice is to prescribe rifampin for contacts of a child having *Hemophilus influenzae* meningitis. We give it to all members of a household that includes another child younger than 5 years old. We also recommend that chemoprophylaxis be considered for other children and staff in day-care centers. Since the effectiveness of this regimen is not known, such prophylaxis should not be a substitute for close surveillance.

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Zoonoses

A ZOONOSIS is a disease transmitted from an animal, usually a vertebrate, to humans. In most cases, the person is exposed because of occupation or avocation. In the textbook by Hubbert and coworkers, *Diseases Transmitted from Animals to Man,* more than 100 conditions are listed; however, only those commonly associated with household pets will be mentioned here.

Psittacosis, a chlamydial infection of birds (especially parakeets, parrots and pigeons), is becoming more common. In 1978, 88 percent of cases in the United States occurred in persons with occupational or hobby exposure to birds. The bird may harbor this organism for a long time and be asymptomatic; however, shedding will occur when the bird is stressed by shipping or illness. In humans, infection usually results from inhalation of the agent from desiccated droppings and often presents as an acute, febrile illness characterized by headache, nonproductive cough, anorexia and change in bowel habit. Pneumonia, demonstrable on x-ray studies of the chest, develops in most patients. Recovery of the agent is not routinely done, but the diagnosis may be established by showing a fourfold or greater titer increase between acute and convalescent specimens in complement fixation antibodies. The treatment of choice in adults is tetracycline, 500 mg every six hours, continued for 10 to 14 days after the patient defervesces. A public health veterinarian should be consulted about treatment of the bird since appropriate treatment varies with the species.

Toxoplasmosis, a systemic protozoan infection, may be acquired or congenital. Acquired toxoplasmosis usually results from human exposure to the oocysts, which sporulate and become infective one to five days after excretion in the feces by a cat. The cat is usually asymptomatic and may shed oocysts intermittently. Human disease may also follow consumption of inadequately cooked meat. The spectrum of disease in humans ranges from asymptomatic infection to acute febrile illness characterized by lymphadenopathy. In a recent outbreak, fever, lymphadenopathy, headache and myalgia developed in most of the symptomatic persons. Of these, 25 sought medical attention but only 12 percent were diagnosed as having toxoplasmosis. Diagnosis may be established by determining serum toxoplasma antibody seroconversion by indirect fluorescent-antibody test or demonstrating a specific toxoplasma IgM antibody titer of 1:16 or greater. A primary infection of women during early pregnancy may lead to death of the fetus. Infection later in pregnancy may cause chorioretinitis and brain damage to the fetus. Newborn infants and symptomatic adults who are not pregnant should be treated with sulfadiazine and pyramethamine. The threat of exposure can be reduced if cat litter is disposed of daily by a person who is not pregnant.

Dogs and cats, particularly when they are young, may transmit many other agents to their owners, including *Yersinia enterocolitica, Giardia lamblia* and *Campylobacter fetus*—all of which cause diarrhea. *Pasturella novicida,* cat scratch fever, *Toxocara canis* and *T cati* (the last two cause visceral larva migrans) are common in pets. Children acquire these infections by eating dirt containing the eggs. Infection can be prevented by periodic deworming of household dogs and discouraging pica in children.

Some zoonoses, such as animal ringworm, are

a nuisance to humans; others, such as leptospirosis may be life threatening. Thus, pediatric and adult histories should include questions concerning exposure to animals at work, at home or through recreational activities, such as camping, to speed accurate diagnosis of the illness.

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The Hazard in Consuming Raw Milk

A RECENT EDITORIAL in *The Lancet* noted that Q fever, paratyphoid fever and gastrointestinal infections such as *Campylobacter* sp, enteropathogenic *Escherichia coli* and *Salmonella* sp can be delivered straight to your door—in raw milk. Tuberculosis and brucellosis from raw milk were major public health problems in the past but have come under excellent control in US dairy herds. However, the recurring outbreaks of *Campylobacter* infection and salmonellosis associated with raw milk consumption in the western United States and elsewhere are disturbing. In early 1981 large outbreaks of *Campylobacter* infection associated with raw milk were reported from Arizona, Kansas and Oregon and outbreaks of *Salmonella* infection were reported from Montana and Washington State.

No type or grade of raw milk including "certified" raw milk is safe from these infections. Salmonellae have been recovered repeatedly from California-produced raw milk, including certified milk, and salmonella outbreaks have occurred in California in association with certified milk. Milk that is "certified" is not certified to be free of pathogens. Rather, certification is a copyrighted designation indicating the milk was produced according to methods and standards specified by the American Association of Medical Milk Commissions, Inc.—methods that have repeatedly failed to prevent contamination with human pathogens.

The most important route by which salmonellae get into milk is through bovine fecal contamination. Yet, salmonellae have been isolated from the udders of cows both with and without mastitis, even when there was no concurrent intestinal infection (as evidenced by positive fecal culture). Thus, milk may become contaminated with salmonellae without exposure to feces or other exogenous sources of contamination.

Salmonella contamination of raw milk may be intermittent and low-grade; and contamination need not be uniformly distributed in a day's production: when the Food and Drug Administration cultured certified raw milk in California in February 1981 in the largest one-day survey to date, they found 20 percent of the containers (4 of 20 half-gallon cartons) produced and bottled by one dairy on the same day to be contaminated with salmonellae.

The route by which *Campylobacter* contaminates milk has not been precisely defined. The probable mechanism is direct fecal contamination since 60 percent of healthy cattle excrete *Campylobacter* in their feces, and *Campylobacter* mastitis has not yet been shown to occur naturally.

Present technology *cannot* prevent or eradicate *Salmonella* and *Campylobacter* infection in milking herds, nor can it prevent contamination of milk produced by such infected cattle. Because occasional fecal contamination occurs during the milking process despite the best efforts of dairies to prevent it, the result is human infection and disease unless milk is pasteurized.

Salmonella and *Campylobacter* diseases in humans are generally not serious but in persons with compromised health (particularly those with malignant conditions and those immunosuppressed by disease or therapy), these infections may be serious. In immunocompromised persons invasive disease with bacteremia, sepsis and widespread dissemination tends to develop; death is not uncommon. Yet "health foods" such as raw milk are sometimes recommended as an adjunct to conventional (and unconventional) therapy for these immunocompromised persons.

Contamination of raw milk has been known since antiquity: a cuneiform tablet from ancient Sumer in lower Mesopotamia written about 5,000 years ago carried the ancient milkers' complaint that if the gods really wanted people to have "clean" milk they would have ". . . placed the udders on the forepart of the cows." But people can have "clean" (safe) milk—through pasteurization. This process not only kills milk-borne pathogens that are infective at low doses but also protects consumers from pathogens (infective at only high doses) that could multiply to great numbers if milk contaminated with pathogens were not continuously refrigerated.

Several professional groups, including the *American Academy of Pediatrics,* the *Conference of State and Territorial Epidemiologists,* the *American Veterinary Medical Association* (AVMA),